Garrard

401

GARRARD
MODEL 401
TRANSCRIPTION TURNTABLE

Instruction Manual

GARRARD ENGINEERING LIMITED NEWCASTLE STREET SWINDON WILTSHIRE

preface

As the owner of this Garrard Model 401 Transcription Turntable you have a product supreme in its class which will maintain its high standard of performance throughout many years of use, with the minimum of attention. This manual will help you to operate and take care of your Model 401 but, if you require any further advice, please do not hesitate to contact your Garrard Agent, or our Technical Service Department at Kembrey Street, Swindon, Wiltshire, Telephone Number Swindon (0793) 6211. Telex 44180.

This manual is supplied with Model 401, Serial No. .....

THE GARRARD MODEL 401 TRANSCRIPTION TURNTABLE

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general information

The Garrard Model 401 is the culmination of half a century of experience in the design and manufacture of high quality record playing equipment and has the elegant appearance characteristic of the best British engineering products.

The superlative performance of this model is achieved by such features as a heavy, balanced turntable with a robust, super-finished spindle and a sturdy intermediate driving wheel.

Each speed can be set precisely by means of a special eddy current braking system and stroboscopic markings on the turntable illuminated by a high-intensity neon lamp.

Every Model 401 is supplied complete with a set of fixing screws, an adaptor for playing records with 1.5in (38 mm) centre holes, lubricating oil, a mounting template, an individual test report and full instructions.

Turntable:
Diecast aluminium with an anti-static rubber mat and stroboscopic engraving on rim for 33 1/3, 45 and 78 rev/min at 50 c/s. A version for 60 c/s is also available. It is accurately balanced, has a diameter of 12 in (305 mm) and weighs approximately 6 lb (2.5 Kg).

Base Plate:
Die cast aluminium, ribbed for rigidity.

Motor
Shaded-pole induction type, magnetically screened by a heavy cast-iron case and suspended on 6 tensioned springs. The rotor is dynamically balanced within exceptionally close limits.

Voltage:
Dual range-110/125 and 220/250 volts a.c. A separate neon lamp is required for each range.

Frequency:
50 or 60 c/s, dependent on the motor pulley and turntable fitted. Alternative pulley and turntable available.

Power Consumption:
Approximately 12 watts.

Wow:
Less than 0.08% r.m.s.

Flutter:
Less than 0.04%r.m.s

Measured with Gaumont Kalee Type 1740 meter with 3000c/s constant frequency record at 33 1/3, 45 and 78 rev/min

Rumble:
Negligible

Insulation:
Tested at 1500 volts ac. for one minute between motor windings and frame and at 500 volts d.c. with an insulation test meter when a resistance greater than 20 Megohms must be registered.

Motor Switch:
Double-pole, fitted with a switch click supressor across each pole.

Speed Ranges:
31.9 to 34.6, 43.2 to 46.8 and 75 to 81 rev/min. approximately.

Size:
14 5/8 in (371mm) from back to front; 13 3/4 in (349mm) wide; 2 in (51mm) above and 3 15/16 in (100mm) below underside of base plate

Weight:
17 1/2 lb (7.9kg)

operation

Referring to Diagram 1.

(1) Place a record on the turntable.
(2) Turn the speed selector to the setting appropriate for the record to be played, or check that this has already been done.
(3) Turn the motor switch control clockwise to start the turntable. This operation also switches on the indicator lamp.
(4) To set speed accurately, place a record on the turntable and switch on, as already described. Place pickup on record and turn the speed adjuster until the stroboscopic markings on the rim of the turntable, appropriate to the speed for which you are setting, appear to remain stationary. The lower marking represents 33 1/3 rev/mm., the centre one 45 rev/mm. and the upper one 78 rev/mm.

For highly accurate work, it is desirable to let the motor run for approximately 10 minutes so that it may reach its normal operating temperature. Speed should always be re-checked after changing the speed range.
To protect the intermediate wheel, the speed selector is interlocked with the motor switch and cannot be operated unless the motor is switched off.
Do not hold the turntable stationary whilst the motor is switched on and never disconnect the power supply until the motor has been switched off

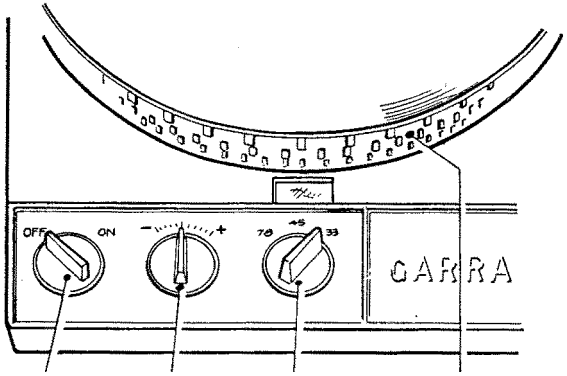


Diagram 1

The bearings of the motor, intermediate wheel and turntable spindle are of the oil-retaining type and rarely need lubrication. When the need for oil becomes apparent, lift off the turntable and lubricate these bearings sparingly with the oil supplied. The motor must be switched off before removing the turntable or replacing it on its spindle. If any difficulty is experienced in removing the turntable an assistant should give the spindle top a downward tap with a small piece of wood, such as the handle of a screwdriver, whilst the turntable is being lifted.

The top bearing of the Motor can be reached through one of the holes in the aluminium brake disc, see Diagram 2.

The top bearing of the Intermediate Wheel should have one drop of oil only applied to it.

The bearings of the Turntable Spindle are lubricated by saturating the felt pad surrounding the spindle and by removing the screw from the top of the housing to apply a few drops of oil through the hole then revealed.

After lubrication, it is essential to remove every trace of oil from the motor pulley, intermediate wheel and the inside of the turntable rim.

Further points for periodical attention are the periphery of the intermediate wheel which must be kept clean by wiping it with a clean, dry cloth, the lever pivots on the underside of the base plate which should be lightly oiled and the sliding surfaces which should be smeared with a light grease.

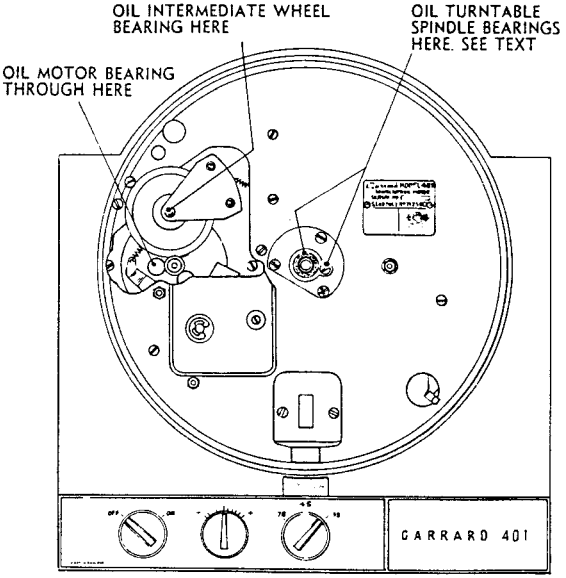

OIL INTERMEDIATE WHEEL BEARING HERE
OIL TURNTABLE SPINDLE BEARINGS HERE. SEE TEXT
OIL MOTOR BEARING THROUGH HERE
GARRARD 401

Diagram 2

adjustments

The Model 401 has been designed to give reliable service over long periods of use. These instructions have been included to enable you to make the few minor adjustments which may become necessary after a prolonged period.

Turntable Speed

When set to 33$^{1}/_{3}$ rev/min. with the pointer of the speed adjuster central, the lower stroboscopic turntable markings should appear to remain stationary when viewed in the light of the neon lamp. If this is not the case, remove the turntable, insert a suitable screwdriver through the small hole in the base plate and turn the speed adjustment screw C on Diagram 3, slightly clockwise if the speed is high and counterclockwise if it is low. Having made this adjustment, the other two speeds should also be correct within close limits.
If the speed adjuster does not enable the correct speed to be set check that the position of the intermediate wheel is that specified under the heading 'Intermediate Wheel'. Should this be satisfactory and turntable speed is too high, slacken the large nut on the underside of the lug attached to the motor casting and which locks the magnet carrier pivot. Then, inserting a screwdriver into the slot at the lower end of the pivot A, situated on the left of the screw mentioned in the previous paragraph, turn the pivot a fraction of a turn in a counterclockwise direction. If the speed is too low turn the pivot in a clockwise direction. Always re-tighten the nut after making an adjustment. If, when using the speed adjuster control, there is difficulty in obtaining 'fast' turntable speed, an alternative motor pulley, identified by a red spot, is available to increase 'fast' speed range.

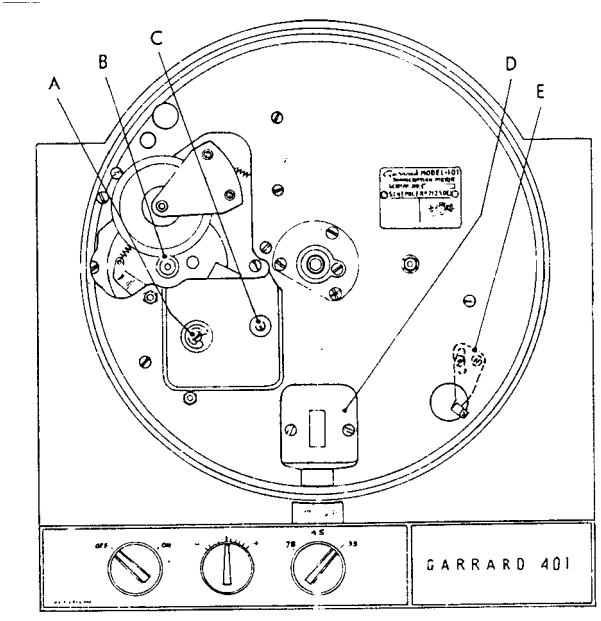


diagram 3

Intermediate Wheel
The height of this rubber-tyred wheel in relation to the motor pulley should be such that there is about 1/32 in (1 mm) clearance between the tyre and an adjacent pulley step at any speed setting. If there is not, slacken the three screws at the top of the motor pulley B and raise or lower the pulley before re-tightening the screws equally.

Turntable Brake
This will bring the turntable to rest within 2 or 3 revolutions of switching off. If it continues to turn for a longer period slacken both screws holding the brake pad lever E, on the underside of the base plate, move the lever outwards slightly, then re-tighten the screws. The action of the switch will be impeded if the brake is set too far out.

Power Supply Voltage Range
If this is altered, say from 220/250 volts to 110/125 volts, the two following adjustments will be required.

(1) After disconnecting the power supply and removing the volt age changeover and connecting block cover, alter the positions of the wire links in accordance with Diagram 4.

(2) With the supply still disconnected, remove the neon lamp below cover D, as instructed in the Installation section, and fit a suitable replacement which is available from our Spares Department. The reference numbers of both lamps are shown in the spares list at the end of this manual.

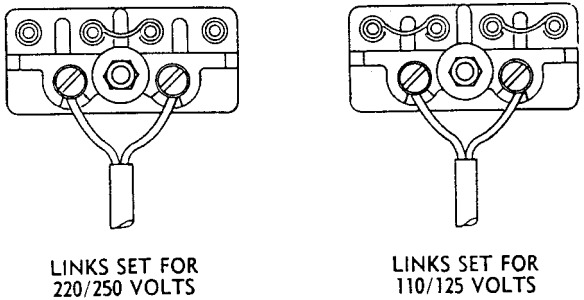


diagram 4

adjustments

Power Supply Frequency

If this is altered, say from 50 c/s to 60 c/s, it will be necessary to fit the alternative motor pulley and turntable, both of which are available from our Spares Department and referred to in the spares list at the end of this manual.

To fit the pulley, remove the turntable, slacken the three small screws at the bottom of the stepped pulley and lift the pulley off the motor spindle. Do not confuse this collar with that on the aluminium brake disc below the pulley. Fit the replacement pulley after checking its identification; brass for 60 c/s and partial nickel plate for 50 c/s, then after checking its position re-tighten the three screws equally. The operating frequency for the stroboscopic marking on the turntable, in cycles per second, is stamped on its underside. This will be either 50 or 60.

Finally it will probably be necessary to make the adjustments mentioned under the heading 'Turntable Speed'.

Model 401 Neon Lamp
Note that Model 401 may be fitted with a neon lamp other than that referred to in the text, line diagrams and parts list of this booklet This lamp is fitted across the front of the unit, illuminating the stroboscopic turntable directly, as in the photograph on page 3 and it is wired so that it is suitable for both 110/125 and 220/250 AC voltage ranges. See page 20.

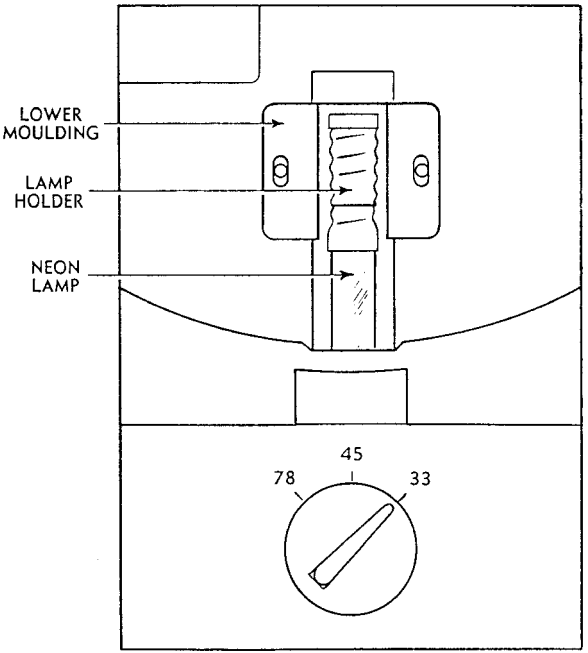


Diagram 5

The Model 401 should be mounted on a board at least 1/2 in (13 mm) thick, or a substantial metal plate, which is also large enough to accommodate the chosen pickup arm. The board or plate must be cut and drilled in accordance with the instructions on the template supplied or, if preferred, with the dimensions on Diagram 8. When the board or plate has been cut, take off the nut holding the cover of the connecting block shown on Diagram 7, remove the cover and attach one end of a power supply to the screwed terminals as shown on Diagram 4 securing it by means of the adjacent clip; then check that the wire links are in the correct position for the power supply voltage and replace the cover. Solder a lead for earthing purposes to the tag, shown on Diagram 7, then screw the four fixing studs into the base plate, at the place shown on the same diagram and the three other corresponding holes in the base plate, until the spring clips stop them.

The leads are then passed through the cut-out in the mounting board from the top and the base plate secured to the board by means of the four studs, in the manner shown on Diagram 6.

Release both Transit Screws completely before fitting the Turntable. These have red heads for identification and tighten the clamping plate which secures the motor to its yoke for protection during transit. They are released by turning them fully counterclockwise using a screwdriver. Re-tighten the screws before transporting the unit at any future time.

Take out both screws holding the cover of the neon lamp to the top of the base plate then detach the cover being careful to retain the spring washers beneath the screw heads. Referring to Diagram 5, move the lower moulding backwards, towards the turntable spindle until it can be lifted clear of the base plate complete with the neon lamp in its holder. Do not lift it so far that the leads to the lamp holder are strained. Unscrew the lamp from its holder. Check that the voltage range marked on its metal cap is correct for the power supply. Re-assemble in the reverse order taking care to avoid over-tightening the screws holding the lower moulding and its cover to the base plate. Finally, connect to the power supply and to a good earth

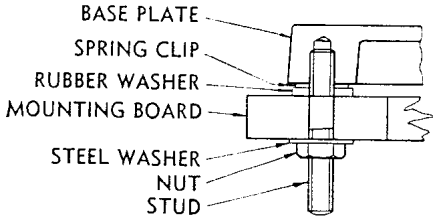
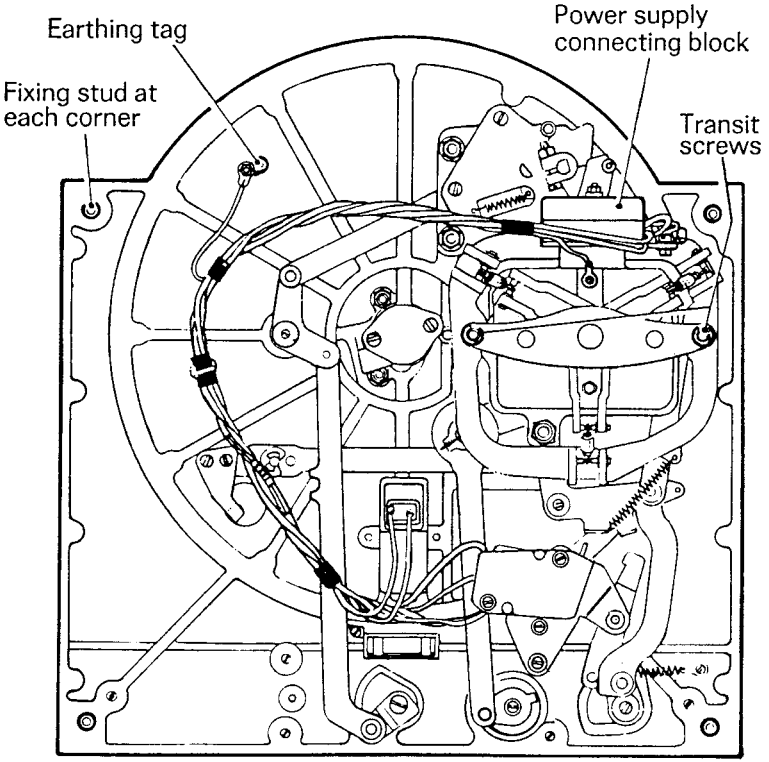
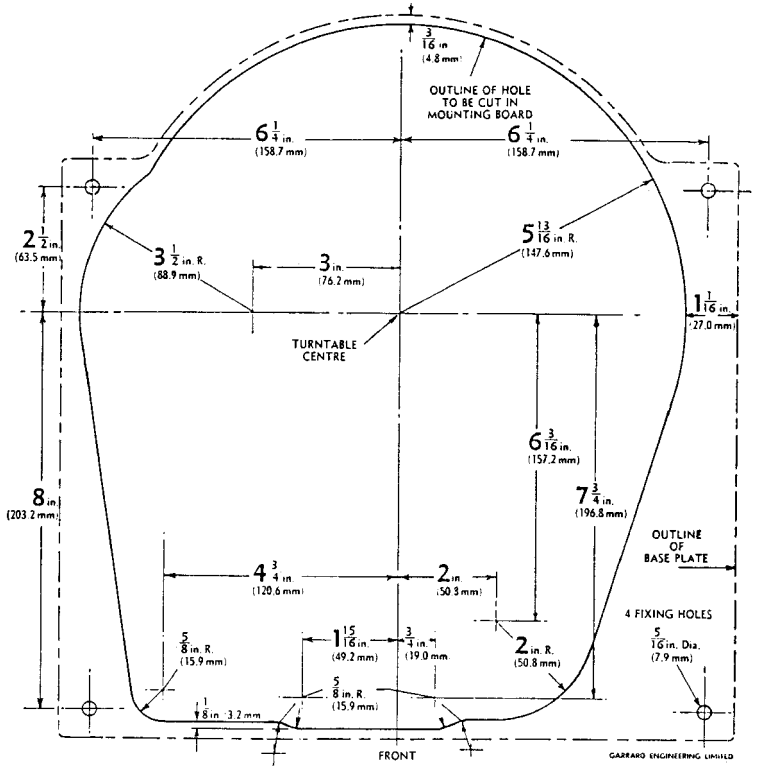


Diagram 6



View from below Base Plate. {See previous page.} Diagram 7

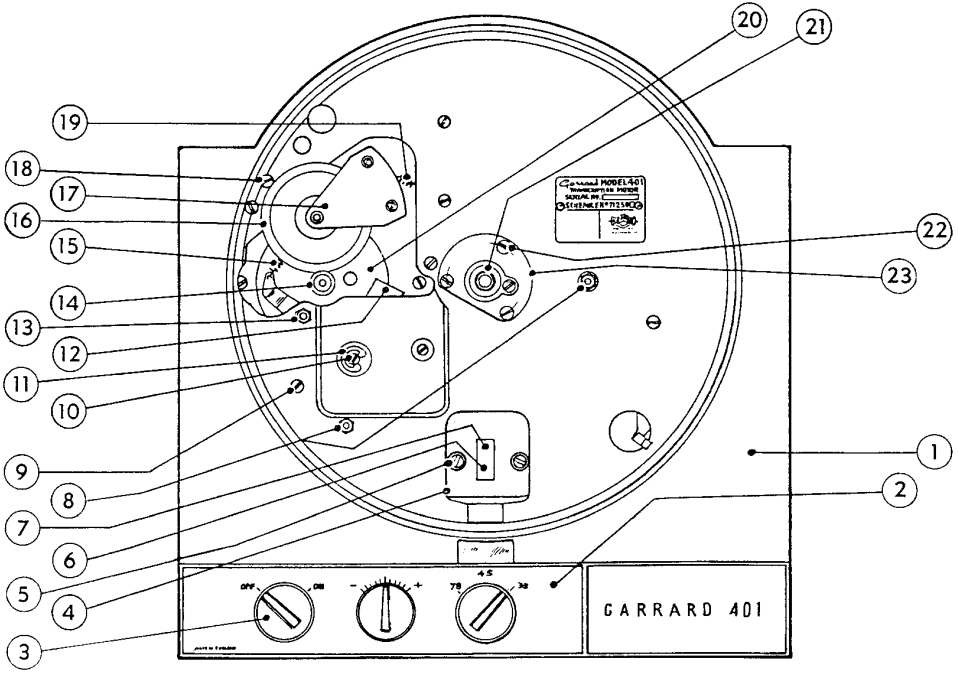

3/16 in (4.8 mm)
OUTLINE OF HOLE TO BE CUT IN MOUNTING BOARD
6 1/4 in. (158.7 mm)
6 1/4 in. (158.7 mm)
2 1/2 in. (63.5 mm)
3 1/2 in. R. (88.9 mm)
3 in. (76.2 mm)
5 13/16 in. R. (147.6 mm)
1 1/16 in. (27.0 mm)
TURNTABLE CENTRE
6 3/16 in. (157.2 mm)
7 3/4 in. (196.8 mm)
8 in. (203.2 mm)
OUTLINE OF BASE PLATE
4 3/4 in. (120.6 mm)
2 in. (50.8 mm)
4 FIXING HOLES
5/16 in. Dia. (7.9 mm)
5/8 in. R. (15.9 mm)
1 15/16 in. (49.2 mm)
3/4 in. (19.0 mm)
2 in. R. (50.8 mm)
5/8 in. R. (15.9 mm)
1/8 in. (3.2 mm)
FRONT
GARRARD ENGINEERING LIMITED

Reduced Template for Mounting Board. Diagram 8

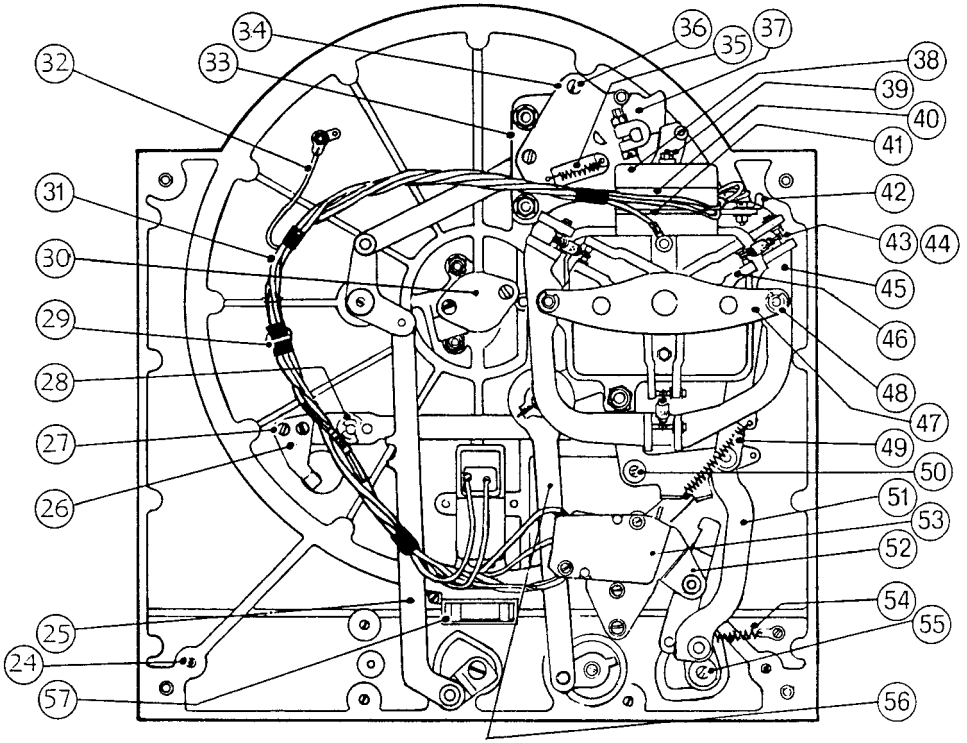
service chart

N.B.. The power supply should be disconnected for all servicing except voltage check. Numbers in brackets correspond to those on Diagrams 9 and 10.

Fault	Cause	Action
Turntable fails to re-volve.	1. No power supply reaching motor.	Check supply with voltmeter. If correct, check action of motor switch (52), tightness of wire links (40) and all connections.
	2. Discontinuity of motor coil winding(s).	Check resistance with ohm-meter. Connected for 220/250 volts, reading should be approximately 400 ohms and for 110/125 volts, approximately 100 ohms. Replace coil(s) if necessary.
	3. Intermediate wheel tension spring (15) stretched or detached.	Replace or re-secure spring.
Turntable speed too fast or slow for correction by speed control	1. Incorrect motor pulley (14) for power supply frequency.	Check pulley's identification: partially nickel plated 50 c/s, brass 60 c/s. Replace if necesary
	2. Wire links (40) set incorrectly for power supply voltage.	Check against diagram on cover of change-over block or Diagram 4
Turntable speed varies with audible effect. (Wow or Flutter)	1. Driving surfaces of motor pulley (14), intermediate wheel (16) and/or turntable contaminated with lubricant.	Wipe surfaces with a clean dry cloth.
	2. Intermediate wheel (16) height incorrect.	See 'Adjustments' page 8.
	3. Loose nut on magnet carrier (10).	Tighten nut.
Rumbling sound through speaker(s).	1. Power supply lead too heavy or pulled tight.	Replace or re-route lead.
	2. Intermediate wheel (16) height incorrect.	See 'Adjustments' page 8.
	3. Motor transit screws (48) not released.	Release screws. See Installation, page 11.



View from above Base Plate, with Turntable removed. Diagram 9



View from below Base Plate. Diagram 10

Ref. No.	Garrard Part No.	Description of Part
1	71510	Base Plate
2	71902	Control Plate with Panel
	71269	Control Panel only
3	71505	Controls (3)
4	71277	Neon Lamp Housing
	71276	Cover for Lamp Housing
5	40023	Screws, fixing Housing (2)
	42501	Spring Washers (2)
	40501	Plain Washers (2)
6	71345	Neon Lamp Holder, below Cover
7	71329/01	Neon Lamp, 220/250 volts. Philips Type GL42M or equivalent
	71329/02	Neon Lamp, 110/125 volts. Philips Type GL15M or equivalent
8	44249	Screws, long, for Lever Pivots (2)
	71319	Pivot Bushes (2)
	40946	Pivot Washers (2)
	41012	Nuts (2)
	42501	Spring Washers (2)
	40627	Plain Washer
9	40471	Screws, for Motor Yoke (3)
	42520	Spring Washers (3)
	40933	Plain Washers (3)
10	71284	Pivot, for Magnet Carrier
	41006	Nut
	42520	Spring Washer
11	43842	Spring Clip
12	71284	Magnet with Carrier

Ref. No.	Garrard Part No.	Description of Part
13	40085	Screw, short, for Lever Pivot
	41012	Nut
	42501	Spring Washer
	71319	Pivot Bush
	40946	Pivot Washer
14	71274	Motor Pulley, 50 c/s (Partially nickel plated)
	71670	Motor Pulley, 60 c/s (Brass)
	72090	Collar, for Pulley, with Screws
	71346	Screws, for Collar (3)
15	41792	Tension Spring, for Intermediate Wheel
16	51858	Intermediate Wheel
17	71311	Top Plate for Support Bracket
	71314	Support Bracket with Spindle
	71341	Lifting Spindle with Support Lever
	41696	Spring Clip
18	40254	Screws for Speed Change Unit (3)
	41012	Nuts (3)
	42501	Spring Washers (3)
	40627	Plain Washers (9)
	71996	Collars (3)
	43101	Grommets (3)
19	41670	Tension Spring, retracting Intermediate Wheel
20	71273	Brake Disc
	72090	Collar, for Disc, with Screws
	71346	Screws, for collar (3)

spare parts list

Ref. No.	Garrard Part No.	Description of Part
	71898	50 cycle Pulley with Collar and Screws
	71899	60 cycle Pulley with Collar and Screws
21	71761	Turntable Spindle only
	51888	Spring Clip, for Spindle
22	40151	Screws, for Turntable Spindle Housing (3)
	41006	Nuts (3)
	42520	Spring Washers (3)
23	71765	Turntable Spindle complete with Housing
	40776	Felt Pad
	40064	Screw for Oil-hole
	40858	Plain Washer
24	44034	Screws for Control Plate (6)
25	71254	Speed Change Lever Assembly
26	71900	Brake Pad Lever with Pad
27	40055	Screws for Brake Pad Lever
	40519	Plain Washers (2)
28	41788	Spring Clip
	40678	Plain Washer
29	41737	Spring Support
	40132	Screw
	41061	Nut
	42501	Spring Washer
	72002	Cable Clip
30	51802	Thrust Plate for Turntable Spindle
	52075	Gasket
	40132	Screws, for Thrust Plate (2)

Ref. No.	Garrard Part No.	Description of Part
	42501	Spring Washers (2)
	52493	Thrust Pad
31	60542	Lead and Switch Assembly complete with Suppressors
32	53110/02	Earth Lead
	40182	Screw
	41012	Nut
	42501	Spring Washer
	43000	Solder Tag
33	71253	Top Mounting Plate, with Pillars
34	71257	Bottom Mounting Plate Assembly
35	41639	Tension Spring, for Bottom Mounting Plate
36	40182	Screws (3)
	42501	Spring Washers (3)
	40501	Plain Washers (3)
37	51834	Lifting Cam
	40018	Screw
	41006	Nut
38	54982	Cover for Voltage Changeover Block
39	40443	Stud
	41012	Nuts (3)
	42501	Spring Washer
	40627	Plain Washer
40	72111	Voltage Changeover Block, complete with Cover
	60135	Voltage Changeover Block Body
	54926	Wire Links (2)

Ref. No.	Garrard Part No.	Description of Part
41	51875	Mounting Plate
42	50564	Lead Clip
	40182	Screw
	41012	Nut
	42501	Spring Washer
43	71325	Tension Springs for Motor, Short (3)
	71326	Tension Springs for Motor, Long (3)
44	71275	Pins for Springs (12)
	41761	Spring Clips (24)
45	71262	Yoke, for Motor
46	60543	Motor, complete with Yoke and Changeover Block and Loom
	60120	Motor, with Changeover Block and Loom
	60132	Top Cover, with Bearing
	60131	Bottom Cover, with Bearing
	43210	Thrust Ball for Bottom Bearing
	60206	Stator, complete with Coils
	60204	Stator Coils only (2)
	60212	Rotor, with Spindle
	60211	Collar for Rotor
	60110	Studs for Motor Covers (2)
	41012	Nuts (4)
	42501	Spring Washers (4)
47	53580	Transit Clamping Plate
48	44251	Screws for Clamping Plate (2)
	44863	Compression Springs (2)
	55396	Collars (2)
	41761	Spring Clips (2)
49	44797	Tension Spring for Switch Lever
50	71319	Lever Pivot Bushes (3)
	40946	Lever Pivot Washers (3)
51	71255	On/Off Lever Linkage
52	72593	Switch Bracket Assembly
	40350	Screw
	42526	Washer
53	73011	Cover,for Switch
	44220	Screw, for Cover
	42526	Washer
54	41506	Tension Spring for Catch Lever
	40627	Plain Washer
	43000	Anchor Tag
	40021	Screw
55	44248	Screws for Controls (3)
	40836	Plain Washers (3)
	42520	Spring Washers (3)
56	71256	Speed Adjusting Lever Unit
57	71331	Reflector, with Housing
	71332	Fibre Shield
	44028	Screws, for Housing (2)
	71333	Window

spare parts list

The following items are also available, but not indicated on the diagram:-

71251/01	Turntable, with Mat and Centre Trim Disc (50 c/s)
71281/01	Turntable only (50 c/s)
71251/02	Turntable, with Mat and Centre Trim Disc (60 c/s)
71281/02	Turntable only (60 c/s)
71689	Turntable Mat and Centre Trim Disc
59602/08	Adaptor, for large centre hole records, with Spring Clip
55743	Bottle of lubricating oil
72001	Studs, fixing Base Plate, with Spring Clips (4)
41058	Nuts, for Studs (4)
40678	Plain Washers, for Studs (4)
40962	Rubber Washers,for Studs (4)
71864	Resistor, for Neon Lamp Lead. 5,600 ohms 1/2 watt ± 10%
71980	Conversion Kit; from 50 c/s, 220/250 volts, to 60 c/s, 110/125 volts, comprising Turntable, Motor Pulley and Neon Lamp.
71979	Conversion Kit; from 60 c/s, 110/125 volts, to 50 c/s, 220/250 volts, comprising Turntable, Motor Pulley and Neon Lamp.

Note (from page 10)

If your unit is fitted with a neon lamp which illuminates the stroboscopic turntable directly, the references to the neon lamp and its housing made in this booklet are not applicable.

If ever you require a lamp for your unit, lift it from its location at the front of the unit sufficiently to note its type number and quote this to our Spares Department. Fitting instructions are supplied with the new lamp.